Arch Chemicals, Inc.

MATERIAL SAFETY DATA

FOR ANY EMERGENCY, CALL 24 HOURS/7 DAYS:	**1-800-654-6911**
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL MSDS CONTROL:	1-800-511-MSDS

PRODUCT NAME: HTH® STABILIZER AND CONDITIONER

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE: 12-02-2002 SUPERCEDES: 12-17-2001
MSDS NO: 00011-0059 - 61309

MANUFACTURER: **Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204**

SYNONYMS: Isocyanuric acid, Cyanuric acid
CHEMICAL FAMILY: Isocyanurate
FORMULA: (HCNO)\3
DESCRIPTION: Chlorine stabilizer for swimming pool use.
OSHA HAZARD CLASSIFICATION: Skin and eye irritant

SECTION 2 COMPONENT DATA

PRODUCT COMPOSITION
CAS or CHEMICAL NAME: Cyanuric acid
CAS NUMBER: 108-80-5
PERCENTAGE RANGE: 90-99%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Sulfuric acid
CAS NUMBER: 7664-93-9
PERCENTAGE RANGE: 0-1%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:		1.0		1.0
CEILING:	None		None	
STEL:	None			3.0

CAS or CHEMICAL NAME: Water
CAS NUMBER: 7732-18-5
PERCENTAGE RANGE: 0-10%
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Ammelide
CAS NUMBER: 645-93-2
PERCENTAGE RANGE: 0-0.5%

HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Ammeline
CAS NUMBER: 645-92-1
PERCENTAGE RANGE: 0-0.5%
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established

SECTION 3 PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID CONTACT WITH SKIN, EYES, AND CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER.
STORAGE CONDITIONS: Store in a cool, dry area.
DO NOT STORE AT TEMPERATURES ABOVE: 60 Deg.C (140 Deg.F)
PRODUCT STABILITY AND COMPATIBILITY
SHELF LIFE LIMITATIONS: Unlimited
INCOMPATIBLE MATERIALS FOR PACKAGING: None known
INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: None known

SECTION 4 PHYSICAL DATA

APPEARANCE: White granules or powder
MELTING POINT: Sublimes at 320-330 Deg.C (608-626 Deg.F)
BOILING POINT: Not Applicable
DECOMPOSITION TEMPERATURE: Not Applicable
SPECIFIC GRAVITY: 2.5
BULK DENSITY: 0.79-0.85(g/cc)
pH: 3.8-4.0
VAPOR PRESSURE @ 25 DEG.C: Not Applicable
SOLUBILITY IN WATER: 0.27% @ 25 Deg.C
VOLATILES, PERCENT BY VOLUME: Not Applicable
EVAPORATION RATE: Not Applicable
VAPOR DENSITY: Not Applicable
MOLECULAR WEIGHT: 129.08
ODOR: None
COEFFICIENT OF OIL/WATER DISTRIBUTION: Not Applicable

SECTION 5 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:
RESPIRATORY PROTECTION: Respiratory protection not normally needed. If dusting occurs, wear a NIOSH approved dust respirator.
VENTILATION: Use local exhaust ventilation to minimize dust levels.
SKIN AND EYE PROTECTIVE EQUIPMENT: Wear gloves and chemical goggles to avoid skin and eye contact.

EQUIPMENT SPECIFICATIONS:
RESPIRATOR TYPE: Not normally needed
GLOVE TYPE: Neoprene or chemically impermeable

SECTION 6 FIRE AND EXPLOSION HAZARD INFORMATION

FLAMMABILITY DATA:
FLAMMABLE: No
COMBUSTIBLE: No
PYROPHORIC: No
FLASH POINT: Not Applicable
AUTOIGNITION TEMPERATURE: Not Applicable
FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VOLUME IN AIR): Not Applicable

NFPA RATINGS: Not Established

HMIS RATINGS:
Health: 1
Flammability: 0
Reactivity: 0

EXTINGUISHING MEDIA: Not Applicable
FIRE FIGHTING TECHNIQUES AND COMMENTS: Use water to cool containers exposed to fire. Use extinguishing agent suitable for surrounding material.

SECTION 7 REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE:
TEMPERATURES ABOVE: 330 Deg.C (626 Deg.F)
MECHANICAL SHOCK OR IMPACT: No
ELECTRICAL (STATIC) DISCHARGE: No
HAZARDOUS POLYMERIZATION: Will Not Occur
INCOMPATIBLE MATERIALS: Oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, Carbon dioxide, Oxides of nitrogen, and cyanic acid.

SUMMARY OF REACTIVITY:
OXIDIZER: No
PYROPHORIC: No
ORGANIC PEROXIDE: No
WATER REACTIVE: No

SECTION 8 FIRST AID

EYES: Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Call a physician at once.

SKIN: Immediately flush with water for 15 minutes. Wash the contaminated skin with soap and water. If irritation develops, call a physician. If clothing comes in contact with the product, the clothing should be removed immediately and it should be laundered before re-use.

INGESTION: Immediately drink water to dilute. Consult a physician.

INHALATION: If person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Call a physician. In the event that an individual inhales enough vapor to lose consciousness, person should be moved to fresh air at once and a physician should be called immediately. If breathing has stopped, artificial respiration should be given immediately. In all cases, ensure adequate ventilation and provide respiratory protection before the person returns to work.

SECTION 9 TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION
Ingestion, skin and eye contact

WARNING STATEMENTS AND WARNING PROPERTIES
DO NOT TAKE INTERNALLY. MAY CAUSE MILD SKIN AND EYE IRRITATION. INHALATION OF DUST MAY CAUSE MILD MUCOUS MEMBRANE AND RESPIRATORY IRRITATION.

HUMAN THRESHOLD RESPONSE DATA
ODOR THRESHOLD: No Data
IRRITATION THRESHOLD: No Data
IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: The IDLH concentration has not been established for this product.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE

INHALATION
Acute:
No significant adverse effects to health would be expected to occur from inhalation with normal use of this product. However, if dust is created and inhaled, inhalation may cause mild irritation to the throat, mucous membranes and upper respiratory tract.
CHRONIC:
None known or reported

SKIN
ACUTE:
Skin contact may cause a mild irritation consisting of transient redness. This irritant effect would not be expected to result in permanent damage.
CHRONIC:
There are no known or reported effects from chronic exposure except for effects similar to those experienced from single exposure.

EYE
Contact with the eyes may cause a mild irritation consisting of redness, swelling and mucous membrane discharge to the conjunctiva. No corneal damage or visual impairment would be expected to occur.

INGESTION
ACUTE:
Ingestion may cause gastrointestinal discomfort with any or all of the following symptoms: nausea, vomiting, lethargy or diarrhea.
CHRONIC:
There are no known or reported effects from chronic exposure except for effects similar to those experienced from single exposure.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE
None known or reported.

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY
None known or reported

ANIMAL TOXICOLOGY
ACUTE TOXICITY:
Inhalation LC 50: No Data
Dermal LD 50: > 2 g/kg (rabbit)
Oral LD 50: > 5 g/kg (rat)
Irritation: May cause mild eye and skin irritation

ACUTE TARGET ORGAN TOXICITY:
No organs known to be damaged from exposure to this product. May cause mild skin and eye irritation.

CHRONIC TARGET ORGAN TOXICITY:
Based on data from toxicological investigations, cyanuric acid does not result in direct target organ damage. Damage to the kidneys and bladder has been observed in rats when these animals are provided a saturated solution (5375 ppm) of cyanuric acid for their drinking

water. During excretion of high amounts by the kidney, stones of cyanuric acid can form (calculi) resulting in mechanical damage which is secondary to stone formation.
This effect would not pose a risk to humans during manufacturing, use as a disinfectant in swimming pools, and even consumption of dilute solutions (1-10 ppm) of cyanuric acid. Cyanuric acid is excreted unchanged rapidly via the kidneys. It lacks the potential to bioaccumulate in the body.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:
There are no known or reported effects on reproductive function or fetal development from exposure to this product.

Monosodium cyanurate (the sodium salt of cyanuric acid) has been tested by oral gavage in pregnant rats and rabbits. No teratogenic effects were seen in the offspring of either species.

Sulfuric acid aerosol (95.7% purity) was tested in pregnant mice and rabbits exposed to concentrations of 0, 5 and 20 mg/cubic meter by inhalation on gestational days 6-15 and 6-18, respectively. No reproductive or developmental effects were seen in either species at any of the exposure concentrations utilized.

CARCINOGENICITY:
This product is not known or reported to be carcinogenic by any reference source including IARC, OSHA, NTP or EPA.

Laboratory toxicological studies in rats and mice (lifetime exposure) indicate that cyanuric acid is not carcinogenic.

Sulfuric acid is not known or reported to be carcinogenic by any reference source including: IARC, OSHA, NTP, or EPA. IARC evaluated several epidemiology studies where individuals in a variety of industries had been exposed to a mixture of strong inorganic acid mists and concluded that there is sufficient evidence that occupational exposure to a mixture of strong inorganic acid mists is carcinogenic to humans. Because cancer has not been observed in animals when they are exposed only to sulfuric acid mist, exposure to sulfuric acid by itself was not determined to be carcinogenic to humans.

MUTAGENICITY:
This product is not known or reported to be mutagenic.

Cyanuric acid was determined to be non-mutagenic in the Ames assay, both with and without metabolic activation.

Monosodium cyanurate (the sodium salt of cyanuric acid) has been tested in a battery of mutagenicity/genotoxicity assays and no mutagenic or genotoxic activity was detected in any of these assays.

AQUATIC TOXICITY:
Cyanuric acid:
Bluegill sunfish: 96 hr. LC50: > 2,100 mg/l
Fathead minnow: 96 hr. LC50: > 2,100 mg/l
Rainbow trout: 96 hr. LC50: > 2,100 mg/l
Daphnia magna: 48 hr. LC50: > 1,000 mg/l
Algae: 96 hr. EC50: 655 mg/l

Toxicity to wildlife:
Monosodium cyanurate (sodium salt of cyanuric acid):
Mallard duck: 8 day dietary LC50: > 10,000 ppm

Bobwhite quail: 8 day dietary LC50: > 10,000 ppm

SECTION 10 TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT REGULATED AS A DOT HAZARDOUS MATERIAL.

SECTION 11 SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.

REPORTABLE QUANTITY: None Established (Per 40 CFR 302.4)

SPILL MITIGATION PROCEDURES:

Air Release - Not Applicable

Water Release - this material is heavier than water. This material is very slightly soluble in water.

Land Spill - Keep spill materials dry and free of all foreign matter. Containerize in a clean, dry container.
SPILL RESIDUES: Dispose of per guidelines under Section XII, WASTE DISPOSAL.

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE-FIGHTING SITUATIONS: No extra protection required beyond that listed in Section V (in case of fire, use normal fire fighting equipment), including a NIOSH approved self-contained breathing apparatus (SCBA).

SECTION 12 WASTE DISPOSAL

If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D.

As a nonhazardous solid waste it should be disposed of in accordance with local, state, and federal regulations by disposal in a secure chemical landfill.
CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

SECTION 13 ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT: This substance is listed on the Toxic Substances Control Act inventory.

SUPERFUND AMENDMENT AND REAUTHORIZATION ACT TITLE 3:

HAZARD CATEGORIES, PER 40 CFR 370.2:
HEALTH: Immediate (Acute)
PHYSICAL: None

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP. A:

EXTREMELY HAZARDOUS SUBSTANCES - THRESHOLD PLANNING QUANTITY:
None Established

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:

This mixture or tradename product contains a toxic chemical or chemicals subject to the reporting requirements of Section 313 of Title 3 of the Superfund Ammendments and Reauthorization Act of 1986 and 40 CFR 372. (See Section 2 for Composition)
CHEMICALS LISTED ARE: Sulfuric Acid

SECTION 14 ADDITIONAL INFORMATION

MSDS REVISION STATUS: Revision to Exposure Standards (Section 02), Personal Protective Equipment (Sections 05 & 11), HMIS Ratings (Section 06) and Aquatic Toxicity (Section09)

SECTION 15 MAJOR REFERENCES

1. Lusby, Andrea, F., et al., Variation in Mutagenicity of s-Triazine Compounds Tested on Four Salmonella Strains. Environmental Mutagenesis, Vol. 1, No. 3, pp. 287-290, 1979.
2. Canelli, Edmondo, Chemical, Bacteriological and Toxicological Properties of Cyanuric Acid and Chlorinated Isocyanurates as Applied to Swimming Pool Disinfection. American Journal of Public Health, Vol. 64, No. 2, pp. 155-162, February 1974.
3. Acute Toxicity of Cyanuric Acid to the Water Flea (Daphnia Magna). EG and G, Bionomics Aquatic Toxicology Laboratory, Wareham, MA. Study # ICG/T-78-076, October 1977.
4. Report to Monsanto Company, Four Day Static Aquatic Toxicity Studies with Monosodium Cyanurate, Lot #P-231291 in Rainbow Trout and Blue Gils. Industrial Bio-Test Laboratories, Inc., Northbrook, IL. BTL #75-36, IBT #621-07227. September 5, 1975

Additional references are available upon request.

Arch Chemicals, Inc.
MSDS Control
501 Merritt 7
PO Box 5204
Norwalk, CT 06856-5204

Arch Chemicals, Inc.

MATERIAL SAFETY DATA

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FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
MSDS QUESTIONS & REQUESTS, CALL MSDS CONSULTATION LINE:	1-800-511-MSDS

PRODUCT NAME: HTH® SHOCK 'N SWIM

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE: 03-04-2004 SUPERCEDES: 02-18-2004
MSDS NO: 05119-0001 - 51103

Manufacturer: Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204

SYNONYMS: None
CHEMICAL FAMILY: Hypochlorite Mixture
FORMULA: Not Applicable/Mixture
DESCRIPTION: Sanitizer and Oxidizer
OSHA HAZARD CLASSIFICATION: Toxic by inhalation, corrosive to eyes and skin, skin and eye hazard, lung toxin

SECTION 2 COMPONENT DATA

PRODUCT COMPOSITION

CAS or CHEMICAL NAME: Calcium hypochlorite
CAS NUMBER: 7778-54-3
PERCENTAGE RANGE: 40-55%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: 1 mg/cubic meter (15 min. STEL - TWA): Arch chemicals Internal Exposure Standard

CAS or CHEMICAL NAME: Sodium chloride
CAS NUMBER: 7647-14-5
PERCENTAGE RANGE: 5-15%
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Calcium chlorate
CAS NUMBER: 10137-74-3
PERCENTAGE RANGE: 0-4%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Calcium chloride
CAS NUMBER: 10043-52-4
PERCENTAGE RANGE: 0-4%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Calcium hydroxide

CAS NUMBER: 1305-62-0
PERCENTAGE RANGE: 0-5%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:		None		5
CEILING:		None		None
STEL:		None		None

CAS or CHEMICAL NAME: Calcium carbonate
CAS NUMBER: 471-34-1
PERCENTAGE RANGE: 0-4%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:		15 (Total dust) 5 (Respirable fraction)		10
CEILING:		None		None
STEL:		None		None

CAS or CHEMICAL NAME: Magnesium sulfate heptahydrate
CAS NUMBER: 10034-99-8 (anhydrous 7487-88-9)
PERCENTAGE RANGE: 25-35%
HAZARDOUS PER 29 CFR 1910.1200:.Yes
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Water
CAS NUMBER: 7732-18-5
PERCENTAGE RANGE: 17-22%
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established

SECTION 3 PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID INHALATION OF DUST AND FUMES. AVOID CONTACT WITH EYES, SKIN OR CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER. REMOVE AND WASH CONTAMINATED CLOTHING BEFORE REUSE.
STORAGE CONDITIONS: Keep product tightly sealed in original containers. Store product in a cool, dry, well-ventilated area. Store away from combustible or flammable products. Keep product packaging clean and free of all contamination, including, e.g., other pool treatment products, acids, organic materials, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc.
DO NOT STORE AT TEMPERATURES ABOVE: 52 Deg.C (125 Deg.F)
In the event that the calcium hypochlorite were to separate from the blend, storage above this temperature may result in rapid decomposition, evolution of chlorine gas and heat sufficient to ignite combustible products. Also, the magnesium sulfate heptahydrate will begin to loose water of crystallization at approximately 150 Deg.C (302 Deg.F); Should all the water of crystallization be lost, the likelihood of rapid decomposition occurring, as above, would be increased.

PRODUCT STABILITY AND COMPATIBILITY
SHELF LIFE LIMITATIONS: Shelf life (that is, the period of time before the product goes below stated label strength) is determined by storage time and temperatures. Do not store product at temperatures above 52

Deg.C (125 Deg.F). When stored under moderate temperature conditions, product will maintain stated label strength for approximately two years. Prolonged storage at 35 Deg.C (95 Deg.F) or above will significantly shorten the shelf life. Storage in a climate-controlled storage area or building is recommended in those areas where extremes of high temperature occur.

INCOMPATIBLE MATERIALS FOR PACKAGING: Product packaging must be clean and free of contamination by other materials, including, e.g., other pool treatment products, acids, organic materials, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc.

INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: Do not allow product to come in contact with other materials, including, e.g., other pool treatment products, acids, organic materials, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc.

SECTION 4 PHYSICAL DATA

APPEARANCE: White granules
FREEZING POINT: Not Applicable
BOILING POINT: Not Applicable
DECOMPOSITION TEMPERATURE: Onset - Approx. 170-180 Deg.C (338-356 Deg.F)
SPECIFIC GRAVITY: Not Applicable
BULK DENSITY: 0.8 g/cc, loose
pH @ 25 DEG.C: 10.0-10.8 (1% soln.)
SOLUBILITY IN WATER: Approximately 18% @ 25 Deg.C. (Product contains calcium hydroxide and calcium carbonate which will leave a residue.)
VAPOR PRESSURE @ 25 DEG.C: Not Applicable
VOLATILES, PERCENT BY VOLUME: Not Applicable
EVAPORATION RATE: Not Applicable
VAPOR DENSITY: Not Applicable
MOLECULAR WEIGHT: 143 (Active ingredient)
ODOR: Chlorine-like
COEFFICIENT OF OIL/WATER DISTRIBUTION: Not Applicable

SECTION 5 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:

RESPIRATORY PROTECTION: Wear a NIOSH approved respirator if dusts are created.

VENTILATION: Use local exhaust ventilation to minimize dust and chlorine level where industrial use occurs. Otherwise, ensure good general ventilation.

SKIN AND EYE PROTECTIVE EQUIPMENT: Wear gloves and safety glasses to avoid skin and eye contact. Where industrial use occurs, chemical goggles or full impermeable suit may be required.

EQUIPMENT SPECIFICATIONS (WHEN APPLICABLE):

RESPIRATOR TYPE: NIOSH approved full face piece air-purifying respirator with chlorine cartridges and dust/mist prefilter. Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or in exposure levels which exceed 10X the PEL.

PROTECTIVE CLOTHING TYPE: Neoprene, Nitrile, Natural rubber (This includes: gloves, boots, apron protective suit)

SECTION 6 FIRE AND EXPLOSION HAZARD INFORMATION

This product contains an ingredient which is both a strong oxidizer and is chemically reactive with many substances. Strong oxidizers are capable of intensifying a fire once started. Because of this, any contamination of the product with other substances by spill or otherwise should be avoided. Also see section 3

FLAMMABILITY DATA:
- FLAMMABLE: No
- COMBUSTIBLE: No
- PYROPHORIC: No
- FLASH POINT: Not Applicable
- AUTOIGNITION TEMPERATURE: Not Applicable
- FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VOLUME IN AIR): UEL - Not Applicable LEL - Not Applicable

NFPA RATINGS:
NFPA Oxidizer Class: Meets the criteria of an NFPA Class 1 Oxidizer

HMIS RATINGS:
- Health: 3
- Flammability: 0
- Reactivity: 1

EXTINGUISHING MEDIA:
Water only

FIRE FIGHTING TECHNIQUES AND COMMENTS:
Use water to cool containers exposed to fire. Also see Section 11.
OTHER: Do not use dry extinguishers containing ammonium compounds

SECTION 7 REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE:
- TEMPERATURES ABOVE: 170 Deg.C (338 Deg.F)
- MECHANICAL SHOCK OR IMPACT: No
- ELECTRICAL (STATIC) DISCHARGE: No
- HAZARDOUS POLYMERIZATION: Will not occur
- INCOMPATIBLE MATERIALS: This product is chemically reactive with many substances, including, e.g., other pool treatment products, acids, organics, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, corrosive, flammable or combustible materials.
- HAZARDOUS DECOMPOSITION PRODUCTS: Chlorine gas
- OTHER CONDITIONS TO AVOID: Storage at temperatures >125 Deg.F (52 Deg.C) Prevent ingress of humidity and moisture into container or package. Always close the lid.

SUMMARY OF REACTIVITY: (See also Section 6)
- OXIDIZER: No (Contains an oxidizer - calcium hypochlorite)
- PYROPHORIC: No
- ORGANIC PEROXIDE: No
- WATER REACTIVE: No
- OTHER: Arch calcium hypochlorite products meet the specifications of ASTM method E-487-74 as set forth in 49 C. F. R. Sec. 173.21, Title 49-Code of Federal Regs.(DOT Regs.)

SECTION 8 FIRST AID

EYES: Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Call a physician at once.

SKIN: Immediately flush with water for at least 15 minutes. Call a physician. If clothing comes in contact with the product, the clothing should be removed immediately and should be laundered before re-use.

INGESTION: Immediately drink large quantities of water. DO NOT induce vomiting. Call a physician at once. DO NOT give anything by mouth if the person is unconscious or if having convulsions.

INHALATION: Remove victim to fresh air. Support respiration if needed. Call a physician.

SECTION 9 TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION
Inhalation, skin and eye contact, ingestion

WARNING STATEMENT AND WARNING PROPERTIES
MODERATELY TOXIC IF SWALLOWED. AVOID BREATHING DUST OR FUMES. HARMFUL IF PRODUCT IS INHALED IN HIGH CONCENTRATIONS. CAUSES EYE, DIGESTIVE TRACT AND RESPIRATORY TRACT BURNS. DRY MATERIAL CAUSES MODERATE SKIN IRRITATION. WET MATERIAL CAUSES SKIN BURNS

HUMAN RESPONSE DATA
ODOR THRESHOLD: Approximately 2.0 mg/cubic-meter, based on odor threshold of chlorine.
IRRITATION THRESHOLD: Approximately 18-31 mg/cubic meter, based on the irritation threshold of chlorine.
IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: Approximately 63 mg/cubic-meter, based on IDLH concentration of chlorine.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE
INHALATION
ACUTE:
Inhalation of dust or vapor from this product can be irritating to the nose, mouth, throat and lungs. In confined areas, mechanical agitation can result in high levels of dust, and reaction with incompatible materials (as listed in Section VII) can result in high concentrations of chlorine vapor, either of which may result in burns to the respiratory tract, producing lung edema, shortness of breath, wheezing, choking, chest pains, impairment of lung function and possible permanent lung damage.
CHRONIC:
Chronic (repeated) inhalation exposure may cause impairment of lung function and permanent lung damage.

EYE
Severe irritation and/or burns can occur following eye exposure. Contact may cause impairment of vision and corneal damage.

SKIN
ACUTE:
Dermal exposure to dry material causes moderate skin irritation characterized by redness and swelling. Dermal exposure to wet material can cause severe irritation and/or burns characterized by redness, swelling and scab formation. Prolonged skin exposure may cause permanent damage.
CHRONIC:
Effects from chronic skin exposure would be similar to those from single exposure. In addition, chronic exposure to wet material may cause effects secondary to tissue destruction.

INGESTION

ACUTE:

Irritation and/or burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding and/or tissue ulceration. Significant exposure to this material can lead to serious health effects and/or death.

CHRONIC:

There are no known or reported effects from chronic exposure except for effects similar to those experienced from single exposure. The acute corrosivity of this product makes chronic ingestion of significant amounts unlikely

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Asthma, respiratory and cardiovascular disease

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY

None known or reported

ANIMAL TOXICOLOGY

ACUTE TOXICITY:

Inhalation LC 50: >2.04 mg/l (1hr., rat); > 0.51 mg/l (4 hr., rat) - extrapolated from inhalation toxicity studies using calcium hypochlorite

Oral LD 50: Approximately 1200 mg/kg. (rat) based on extrapolation from oral toxicity studies using calcium hypochlorite

Dermal LD 50: > 2 g/kg. (rabbit)

Irritation: Causes burns to eyes. Dry material causes skin irritation, wet material causes skin burns.

ACUTE TARGET ORGAN TOXICITY: This product is corrosive to the eyes and upon inhalation may cause irritation to mucous membranes and respiratory tract. The dry material is irritating to the skin. However when wet, it will produce burns to the skin

CHRONIC TOXICITY:

There are no known or reported effects from repeated exposure except those secondary to burns.

REPRODUCTIVE TOXICITY:

Calcium hypochlorite has been tested for teratogenicity in laboratory animals. Results of this study have shown that calcium hypochlorite is not a teratogen.

CARCINOGENICITY:

This product is not known or reported to be carcinogenic by any reference source, including: IARC, OSHA, NTP or EPA.
One hundred mice were exposed dermally 3 times a week for 18 months to a solution of calcium hypochlorite. Histopathological examination failed to show an increased incidence of tumors.
IARC (International Agency for Research on Cancer) reviewed studies conducted with several hypochlorite salts. IARC has classified hypochlorite salts as having inadequate evidence for carcinogenicity to humans and animals. IARC therefore considers hypochlorite salts to be not classifiable as to their carcinogenicity to humans. (Group 3 substance).

MUTAGENICITY:

Calcium hypochlorite has been tested in the dominant lethal assay in male mice, and it did not induce a dominant lethal response.
Calcium hypochlorite has been reported to produce mutagenic activity in two in vitro assays. It has, however, been shown to lack the capability to produce mutations in animals based on results from the

micronucleus assay. In vitro assays frequently are inappropriate to judge the mutagenic potential of bactericidal chemicals due to a high degree of cellular toxicity. The concentration which produces mutations in these in vitro assays is significantly greater than the concentrations used for disinfection. Based on high cellular toxicity in in vitro assays and the lack of mutagenicity in animals, the risk of genetic damage to humans is judged not significant.

AQUATIC TOXICITY:
Bluegill, 96 hr. LC50: Approximately 0.12 mg/l (nominal, static) based on extrapolation from studies using calcium hypochlorite
Rainbow trout, 96 hr. LC50: 0.22 mg/l (nominal, static) based on extrapolation from studies using calcium hypochlorite
Daphnia magna, 48 hr. LC50: 0.15 mg/l (nominal, static) based on extrapolation from studies using calcium hypochlorite

TOXICITY TO WILDLIFE:
Bobwhite quail, dietary LC50: > 7,000 ppm based on extrapolation from studies using calcium hypochlorite
Mallard ducklings, dietary LC50: > 7,000 ppm based on extrapolation from studies using calcium hypochlorite
Bobwhite quail, oral LD50: Approximately 4800 mg/kg. based on extrapolation from studies using calcium hypochlorite

SECTION 10 TRANSPORTATION INFORMATION

This product is regulated in transport under U.S. DOT 49 CFR 172.101. Product packaged and marked in accordance with Consumer Commodity Exception as permitted in 49 CFR 173.155 and 173.156.

U.S. Ground: RQ, Consumer Commodity (Calcium Hypochlorite), ORM-D
Hazardous Substance as defined in 49 CFR 172.101, Appendix A: Yes

ICAO/IATA Air: Not Regulated in Transport

IMDG Ocean: Not Regulated in Transport

SECTION 11 SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.
REPORTABLE QUANTITY: 10 lbs. (as Calcium hypochlorite) Per 40 CFR 302.4

SPILL MITIGATION PROCEDURES:
Hazardous concentrations in air may be found in local spill area and immediately downwind. Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel.

AIR RELEASE: Vapors may be suppressed by the use of a water fog. All water utilized to assist in fume suppression, decontamination or fire suppression may be contaminated and must be contained before disposal and/or treatment.

WATER RELEASE: This material is heavier than water. This material is soluble in water. Monitor all exit water for available chlorine and pH. Advise local authorities of any contaminated water release.

LAND SPILL: Contact at 1-800-6546-911 immediately.
DANGER: All spills of this product should be treated as contaminated. Contaminated product may initiate a chemical reaction which may spontaneously ignite any combustible material present, resulting in a fire of great intensity. In

case of a spill, separate all spilled product from packaging, debris and other material. Using a clean broom or shovel, place all spilled product into plastic bags, and place those bags into a clean, dry disposal container, properly marked and labeled. Disposal containers made of plastic or metal are recommended. Do not seal disposal containers tightly. Immediately remove all product in disposal containers to an isolated area outdoors. Place all damaged packaging material in a disposal container of water to assure decontamination (i.e. removal of all product) before disposal. Place all undamaged packaging in a clean, dry container properly marked and labeled. Call for disposal procedures.

SPILL RESIDUES:
Dispose of per guidelines under Section 12, WASTE DISPOSAL.
This material may be neutralized for disposal; you are requested to contact ACEAN at 800-6546-911 before beginning any such operation.

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE-FIGHTING SITUATIONS:
Response to a large quantity spill (100 pounds or greater) or when dusting or decomposition gas exposure could occur requires the use of a positive pressure full face supplied air respirator or self contained breathing apparatus (SCBA), chemical resistant gloves, coveralls and boots. In case of fire, this personal protective equipment should be used in addition to normal fire fighter equipment.

SECTION 12 WASTE DISPOSAL

If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D.

As a nonhazardous waste, it should be disposed of in accordance with local, state and federal regulations.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

SECTION 13 ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT:
This substance is listed on the Toxic Substances Control Act inventory.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE 3:
HAZARD CATEGORIES, PER 40 CFR 370.2:
HEALTH:
Immediate (Acute)
PHYSICAL:
None

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP.A:
EXTREME HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY:
None Established
SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:
None Established

SECTION 14 ADDITIONAL INFORMATION

REGULATED UNDER FIFRA, USDA & FDA
MSDS REVISION STATUS: Revision to Section 11

SECTION 15 MAJOR REFERENCES

1. Ishidate, M. et al. (1984). Primary mutagenicity screening of food additives currently used in Japan. Fd. Chem. Toxicol. 22:623-636.
2. Hayashi, M. et al. (1988). Micronucleus tests in mice on 39 food additives and eight miscellaneous chemicals. Fd. Chem. Toxicol. 26:487-500.
3. Report on the Acute Inhalation in Rats, Acute Oral LD50 in Rats, Eye Irritation in Rabbits, Dermal Irritation in Rabbits, and Acute Dermal Toxicity in Rabbits of HTH. Biometric Testing Laboratories, Inc., Whippany, NJ. Experiment Reference #A-1490 (RC-30406), February 9, 1975.
4. Report on the Teratogenic Study with Calcium Hypochlorite in Albino Rats. Industrial Bio-Test Laboratories, Inc., Northbrook, IL. IBT #B758b, April 18, 1972.
5. Report on the Mutagenic Study with Monosodium Cyanurate and Calcium Hypochlorite (HTH) in Albino Mice. Industrial Bio-Test Laboratories, Inc., Northbrook, IL. IBT #E756. April 18, 1972.
6. Chemical Hazard Summary No. 20: Calcium Hypochlorite. Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada L8N 1H6. December 1986.
7. Report on 18-Month Dermal Carcinogenicity Study with Monosodium Cyanuric Acid and HTH in Swiss White Mice. Industrial Bio-Test Laboratories, Inc., Northbrook, IL, IBT #651-00751, April 9, 1974.
8. Report to PPG Industries, Inc. on the Acute Toxicity Studies with PITTCHLOR (Granular Calcium Hypochlorite). Industrial Bio-Test Laboratories, Inc., Northbrook, IL, IBT #601-06659, May 7, 1975.
9. Report on the Acute Toxicity of HTH to Bluegill, Rainbow Trout and the Water Flea. E G & G, Bionomics Aquatic Toxicology Laboratory, Wareham, MA, July 1977.
10. Report on the 8-Day Dietary LD50 Study with HTH in Mallard Ducklings. Industrial Bio-Test Laboratories, Inc., Northbrook, IL, IBT #651-06184,May 15, 1975.
11. Report on the 8-Day Dietary LC50 with HTH in Bobwhite Quail. Industrial Bio-Test Laboratories, Inc., Northbrook, IL, IBT #651-06183.
12. Final Report on the Acute Oral LD50 of Calcium Hypochlorite in Bobwhite Quail. Wildlife International, LTD., Easton, MD, Project #133-107, July 15, 1977.
13. IARC Monographs on the Evaluation of Carcinogenic Risks to Humans. Vol. 52: Chlorinated Drinking Water; Chlorination By-Products; Some Other Halogenated Compounds; Cobalt and Cobalt Compounds. World Health Organization, International Agency for Research on Cancer (IARC), Lyon, France, 1991.
14. Sittig, Marshall, Handbook of Toxic and Hazardous Chemicals and Carcinogens, 2nd Ed., Noyes Publications, Park Ridge, NJ, 1985.
15. Chemical Hazard Response Information System (CHRIS), Vol. II, U.S. Coast Guard, Washington, D.C., 1984.
16. Chlorine and Your Health. The Chlorine Institute, Inc., Washington, D.C., August 1988.
17. ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices, Seventh Edition, 2001. American Conference of Governmental Industrial Hygienists, Inc., Cincinnati, OH.
18. Amoore, John E. and Earl Hautala, Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatiles for 214 Industrial Chemicals in Air and Water Dilution. Journal of Applied Toxicology, Vol. 3, No. 6, pp. 272-290, 1983.
19. Forsberg, K., and S.Z. Mansdorf, Quick Selection Guide to Chemical

Protective Clothing, Second Edition, Van Nostrand Reinhold, N.Y., 1993.
20. Report on Acute Dermal Irritation/Corrosivity Study in Albino Rabbits with IG/MgSO4.7H2O 70:30 Blend. Ricerca Toxicology and Pharmacology Laboratory, LLC, Concord, OH. Document # 013977-1. December 13, 2001.

Additional references are available upon request.

Arch Chemicals, Inc.
MSDS Control
501 Merritt 7
PO Box 5204
Norwalk, CT 06856-5204

Arch Chemicals, Inc.

MATERIAL SAFETY DATA

FOR ANY EMERGENCY, CALL 24 HOURS/7 DAYS:	**1-800-654-6911**
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
FOR ALL MSDS QUESTIONS & REQUESTS, CALL MSDS CONTROL:	1-800-511-MSDS

PRODUCT NAME: HTH® TEST STRIPS

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE: 12-02-2002 SUPERCEDES: 05-24-2001
MSDS NO: 02142-0001 - 30506

MANUFACTURER: **Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204**

SYNONYMS: None
CHEMICAL FAMILY: Not Applicable
FORMULA: Not Applicable/Mixture
USE DESCRIPTION: Test Strips
OSHA HAZARD CLASSIFICATION: This product is not considered to be hazardous under 29 CFR 1910.1200.

SECTION 2 COMPONENT DATA

PRODUCT COMPOSITION
This product is considered to be an article under OSHA 29 CFR 1910.1200.

SECTION 3 PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY.
STORAGE CONDITIONS:
NO SPECIAL STORAGE REQUIREMENTS ARE NECESSARY.

PRODUCT STABILITY AND COMPATIBILITY
SHELF LIFE LIMITATIONS: No Data
INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: Strong oxidizers

SECTION 4 PHYSICAL DATA

APPEARANCE: Test strips
FREEZING POINT: Not Applicable
BOILING POINT: Not Applicable
DECOMPOSITION TEMPERATURE: Not Applicable
SPECIFIC GRAVITY: No Data
BULK DENSITY: No Data
pH @ 25 DEG.C: Not Applicable
VAPOR PRESSURE @ 25 DEG.C: Not Applicable
SOLUBILITY IN WATER: Insoluble
VOLATILES, PERCENT BY VOLUME: Not Applicable
EVAPORATION RATE: Not Applicable
VAPOR DENSITY: Not Applicable

MOLECULAR WEIGHT: Not Applicable
ODOR: None
COEFFICIENT OF OIL/WATER DISTRIBUTION: Not Applicable

SECTION 5 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

Not Applicable - Product is an article.

SECTION 6 FIRE AND EXPLOSION HAZARD INFORMATION

FLAMMABILITY DATA:
EXPLOSIVE: No
FLAMMABLE: No
COMBUSTIBLE: Not Applicable
PYROPHORIC: No
FLASH POINT: Not Applicable
AUTOIGNITION TEMPERATURE: No Data
FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VOLUME IN AIR): LEL - Not Applicable UEL - Not Applicable

EXTINGUISHING MEDIA:
Carbon dioxide, Dry chemical, Water spray

FIRE FIGHTING TECHNIQUES AND COMMENTS:
No special instructions, same as for wood or paper.
Use water to cool containers exposed to fire.

SECTION 7 REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE:
TEMPERATURES ABOVE: No Data
MECHANICAL SHOCK OR IMPACT: No
ELECTRICAL (STATIC) DISCHARGE: No
HAZARDOUS POLYMERIZATION: Will not occur
INCOMPATIBLE MATERIALS: Strong oxidizers
HAZARDOUS DECOMPOSITION PRODUCTS: Carbon monoxide, carbon dioxide, smoke

SECTION 8 FIRST AID

EYES:
Product is an article. - Not an eye irritant.

SKIN:
Product is an article. - Not a skin irritant. Washing any substance off the skin with water is a good safety practice.

INGESTION:
Product is an article. - Not a likely route of exposure.

INHALATION:
Product is an article. - Not a likely route of exposure.

SECTION 9 TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION
This product is an article and would not be expected to exert a significant adverse effect to health from any route of exposure.

WARNING STATEMENTS AND WARNING PROPERTIES
DO NOT TAKE INTERNALLY.

SECTION 10 TRANSPORTATION INFORMATION

THIS MATERIAL IS NOT REGULATED AS A DOT HAZARDOUS MATERIAL.

SECTION 11 SPILL AND LEAKAGE PROCEDURES

If the product is spilled, dispose of as normal household waste.

SECTION 12 WASTE DISPOSAL

Not Applicable - Product is an article.

SECTION 13 ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT:
Product is an article.

SECTION 14 ADDITIONAL INFORMATION

Manufactured by: Environmental Test Systems, Inc

MSDS REVISION STATUS: First Issue

SECTION 15 MAJOR REFERENCES

Joe Sweazy , Technical Services, Environmental Test Systems, Inc.,
P.O. Box 4659, 23575 County Road 106, Elkhart, IN 46514
Phone (219) 262-2060 (Letter to Mr. Len Gober, Arch Chemicals, Inc.)

Arch Chemicals, Inc.
MSDS Control
501 Merritt 7
PO Box 5204
Norwalk, CT 06856-5204

Arch Chemicals, Inc.

MATERIAL SAFETY DATA

FOR ANY EMERGENCY, CALL 24 HOURS/7 DAYS:	**1-800-654-6911**
FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC®:	1-800-424-9300
MSDS QUESTIONS & REQUESTS, CALL MSDS CONSULTATION LINE:	1-800-511-MSDS

PRODUCT NAME: HTH® RELIABLE CLEANING GRANULES

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

REVISION DATE: 07-20-2004 SUPERCEDES: 03-04-2004
MSDS NO: 05118-0001 - 21111

Manufacturer: Arch Chemicals, Inc. 501 Merritt 7 PO Box 5204 Norwalk, CT 06856-5204

SYNONYMS: None
CHEMICAL FAMILY: Hypochlorite Mixture
FORMULA: Not Applicable/Mixture
DESCRIPTION: Sanitizer and Oxidizer
OSHA HAZARD CLASSIFICATION: Toxic by inhalation, corrosive to eyes and skin, skin and eye hazard, lung toxin

SECTION 2 COMPONENT DATA

PRODUCT COMPOSITION
CAS or CHEMICAL NAME: Calcium hypochlorite
CAS NUMBER: 7778-54-3
PERCENTAGE RANGE: 40-55%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: 1 mg/cubic meter (15 min. STEL - TWA): Arch chemicals Internal Exposure Standard

CAS or CHEMICAL NAME: Sodium chloride
CAS NUMBER: 7647-14-5
PERCENTAGE RANGE: 5-15%
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Calcium chlorate
CAS NUMBER: 10137-74-3
PERCENTAGE RANGE: 0-4%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Calcium chloride
CAS NUMBER: 10043-52-4
PERCENTAGE RANGE: 0-4%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Calcium hydroxide

CAS NUMBER: 1305-62-0
PERCENTAGE RANGE: 0-5%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:	None		5	
CEILING:	None		None	
STEL:	None		None	

CAS or CHEMICAL NAME: Calcium carbonate
CAS NUMBER: 471-34-1
PERCENTAGE RANGE: 0-4%
HAZARDOUS PER 29 CFR 1910.1200: Yes
EXPOSURE STANDARDS:

	OSHA(PEL)		ACGIH(TLV)	
	ppm	mg/cubic-meter	ppm	mg/cubic-meter
TWA:		15 (Total dust) 5 (Respirable fraction)		10
CEILING:	None		None	
STEL:	None		None	

CAS or CHEMICAL NAME: Magnesium sulfate heptahydrate
CAS NUMBER: 10034-99-8 (anhydrous 7487-88-9)
PERCENTAGE RANGE: 25-35%
HAZARDOUS PER 29 CFR 1910.1200:.Yes
EXPOSURE STANDARDS: None Established

CAS or CHEMICAL NAME: Water
CAS NUMBER: 7732-18-5
PERCENTAGE RANGE: 17-22%
HAZARDOUS PER 29 CFR 1910.1200: No
EXPOSURE STANDARDS: None Established

SECTION 3 PRECAUTIONS FOR SAFE HANDLING AND STORAGE

DO NOT TAKE INTERNALLY. AVOID INHALATION OF DUST AND FUMES. AVOID CONTACT WITH EYES, SKIN OR CLOTHING. UPON CONTACT WITH SKIN OR EYES, WASH OFF WITH WATER. REMOVE AND WASH CONTAMINATED CLOTHING BEFORE REUSE.

STORAGE CONDITIONS: Keep product tightly sealed in original containers. Store product in a cool, dry, well-ventilated area. Store away from combustible or flammable products. Keep product packaging clean and free of all contamination, including, e.g., other pool treatment products, acids, organic materials, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc.

DO NOT STORE AT TEMPERATURES ABOVE: 52 Deg.C (125 Deg.F)
In the event that the calcium hypochlorite were to separate from the blend, storage above this temperature may result in rapid decomposition, evolution of chlorine gas and heat sufficient to ignite combustible products. Also, the magnesium sulfate heptahydrate will begin to loose water of crystallization at approximately 150 Deg.C (302 Deg.F); Should all the water of crystallization be lost, the likelihood of rapid decomposition occurring, as above, would be increased.

PRODUCT STABILITY AND COMPATIBILITY

SHELF LIFE LIMITATIONS: Shelf life (that is, the period of time before the product goes below stated label strength) is determined by storage time and temperatures. Do not store product at temperatures above 52

Deg.C (125 Deg.F). When stored under moderate temperature conditions, product will maintain stated label strength for approximately two years. Prolonged storage at 35 Deg.C (95 Deg.F) or above will significantly shorten the shelf life. Storage in a climate-controlled storage area or building is recommended in those areas where extremes of high temperature occur.

INCOMPATIBLE MATERIALS FOR PACKAGING: Product packaging must be clean and free of contamination by other materials, including, e.g., other pool treatment products, acids, organic materials, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc.

INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: Do not allow product to come in contact with other materials, including, e.g., other pool treatment products, acids, organic materials, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, all corrosive liquids, flammable or combustible materials, etc.

SECTION 4 PHYSICAL DATA

APPEARANCE: White granules
FREEZING POINT: Not Applicable
BOILING POINT: Not Applicable
DECOMPOSITION TEMPERATURE: Onset - Approx. 170-180 Deg.C (338-356 Deg.F)
SPECIFIC GRAVITY: Not Applicable
BULK DENSITY: 0.8 g/cc, loose
pH @ 25 DEG.C: 10.0-10.8 (1% soln.)
SOLUBILITY IN WATER: Approximately 18% @ 25 Deg.C. (Product contains calcium hydroxide and calcium carbonate which will leave a residue.)
VAPOR PRESSURE @ 25 DEG.C: Not Applicable
VOLATILES, PERCENT BY VOLUME: Not Applicable
EVAPORATION RATE: Not Applicable
VAPOR DENSITY: Not Applicable
MOLECULAR WEIGHT: 143 (Active ingredient)
ODOR: Chlorine-like
COEFFICIENT OF OIL/WATER DISTRIBUTION: Not Applicable

SECTION 5 PERSONAL PROTECTIVE EQUIPMENT REQUIREMENTS

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:

RESPIRATORY PROTECTION: Wear a NIOSH approved respirator if dusts are created.

VENTILATION: Use local exhaust ventilation to minimize dust and chlorine level where industrial use occurs. Otherwise, ensure good general ventilation.

SKIN AND EYE PROTECTIVE EQUIPMENT: Wear gloves and safety glasses to avoid skin and eye contact. Where industrial use occurs, chemical goggles or full impermeable suit may be required.

EQUIPMENT SPECIFICATIONS (WHEN APPLICABLE):

RESPIRATOR TYPE: NIOSH approved full face piece air-purifying respirator with chlorine cartridges and dust/mist prefilter. Air purifying respirators should not be used in oxygen deficient or IDLH atmospheres or in exposure levels which exceed 10X the PEL.

PROTECTIVE CLOTHING TYPE: Neoprene, Nitrile, Natural rubber (This includes: gloves, boots, apron protective suit)

SECTION 6 FIRE AND EXPLOSION HAZARD INFORMATION

This product contains an ingredient (calcium hypochlorite) which is both a strong oxidizer and is chemically reactive with many substances. Strong oxidizers are capable of intensifying a fire once started. Because of this, any contamination of the product with other substances by spill or otherwise should be avoided. Also see section 3

FLAMMABILITY DATA:
- FLAMMABLE: No
- COMBUSTIBLE: No
- PYROPHORIC: No
- FLASH POINT: Not Applicable
- AUTOIGNITION TEMPERATURE: Not Applicable
- FLAMMABLE LIMITS AT NORMAL ATMOSPHERIC TEMPERATURE AND PRESSURE (PERCENT VOLUME IN AIR): UEL - Not Applicable LEL - Not Applicable

NFPA RATINGS:
NFPA Oxidizer Class: Meets the criteria of an NFPA Class 1 Oxidizer

HMIS RATINGS:
- Health: 3
- Flammability: 0
- Reactivity: 1

EXTINGUISHING MEDIA:
- Water only

FIRE FIGHTING TECHNIQUES AND COMMENTS:
- Use water to cool containers exposed to fire. Also see Section 11.
- OTHER: Do not use dry extinguishers containing ammonium compounds

SECTION 7 REACTIVITY INFORMATION

CONDITIONS UNDER WHICH THIS PRODUCT MAY BE UNSTABLE:
- TEMPERATURES ABOVE: 170 Deg.C (338 Deg.F)
- MECHANICAL SHOCK OR IMPACT: No
- ELECTRICAL (STATIC) DISCHARGE: No
- HAZARDOUS POLYMERIZATION: Will not occur
- INCOMPATIBLE MATERIALS: This product is chemically reactive with many substances, including, e.g., other pool treatment products, acids, organics, nitrogen-containing compounds, dry powder fire extinguishers (containing mono-ammonium phosphate), oxidizers, corrosive, flammable or combustible materials.
- HAZARDOUS DECOMPOSITION PRODUCTS: Chlorine gas
- OTHER CONDITIONS TO AVOID: Storage at temperatures >125 Deg.F (52 Deg.C) Prevent ingress of humidity and moisture into container or package. Always close the lid.

SUMMARY OF REACTIVITY: (See also Section 6)
- OXIDIZER: Not considered to be an OSHA oxidizer per 29CFR 1910.1200.
  Not an Oxidizer according to the criteria established by the 49 CFR DOT regulations
  Meets the criteria of a Class 1 Oxidizer as established by the National Fire Protection Association (NFPA)
  Product contains an oxidizer - calcium hypochlorite
- PYROPHORIC: No
- ORGANIC PEROXIDE: No
- WATER REACTIVE: No
- OTHER: Arch calcium hypochlorite products meet the specifications of ASTM method E-487-74 as set forth in 49 C. F. R. Sec. 173.21,

Title 49-Code of Federal Regs.(DOT Regs.)

SECTION 8 FIRST AID

EYES: Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Call a physician at once.

SKIN: Immediately flush with water for at least 15 minutes. Call a physician. If clothing comes in contact with the product, the clothing should be removed immediately and should be laundered before re-use.

INGESTION: Immediately drink large quantities of water. DO NOT induce vomiting. Call a physician at once. DO NOT give anything by mouth if the person is unconscious or if having convulsions.

INHALATION: Remove victim to fresh air. Support respiration if needed. Call a physician.

SECTION 9 TOXICOLOGY AND HEALTH INFORMATION

ROUTES OF ABSORPTION
Inhalation, skin and eye contact, ingestion

WARNING STATEMENT AND WARNING PROPERTIES
MODERATELY TOXIC IF SWALLOWED. AVOID BREATHING DUST OR FUMES. HARMFUL IF PRODUCT IS INHALED IN HIGH CONCENTRATIONS. CAUSES EYE, DIGESTIVE TRACT AND RESPIRATORY TRACT BURNS. DRY MATERIAL CAUSES MODERATE SKIN IRRITATION. WET MATERIAL CAUSES SKIN BURNS

HUMAN RESPONSE DATA
ODOR THRESHOLD: Approximately 2.0 mg/cubic-meter, based on odor threshold of chlorine.
IRRITATION THRESHOLD: Approximately 18-31 mg/cubic meter, based on the irritation threshold of chlorine.
IMMEDIATELY DANGEROUS TO LIFE OR HEALTH: Approximately 63 mg/cubic-meter, based on IDLH concentration of chlorine.

SIGNS, SYMPTOMS, AND EFFECTS OF EXPOSURE
INHALATION
ACUTE:
Inhalation of dust or vapor from this product can be irritating to the nose, mouth, throat and lungs. In confined areas, mechanical agitation can result in high levels of dust, and reaction with incompatible materials (as listed in Section VII) can result in high concentrations of chlorine vapor, either of which may result in burns to the respiratory tract, producing lung edema, shortness of breath, wheezing, choking, chest pains, impairment of lung function and possible permanent lung damage.
CHRONIC:
Chronic (repeated) inhalation exposure may cause impairment of lung function and permanent lung damage.

EYE
Severe irritation and/or burns can occur following eye exposure. Contact may cause impairment of vision and corneal damage.

SKIN
ACUTE:
Dermal exposure to dry material causes moderate skin irritation characterized by redness and swelling. Dermal exposure to wet material

can cause severe irritation and/or burns characterized by redness, swelling and scab formation. Prolonged skin exposure may cause permanent damage.

CHRONIC:

Effects from chronic skin exposure would be similar to those from single exposure. In addition, chronic exposure to wet material may cause effects secondary to tissue destruction.

INGESTION

ACUTE:

Irritation and/or burns can occur to the entire gastrointestinal tract, including the stomach and intestines, characterized by nausea, vomiting, diarrhea, abdominal pain, bleeding and/or tissue ulceration. Significant exposure to this material can lead to serious health effects and/or death.

CHRONIC:

There are no known or reported effects from chronic exposure except for effects similar to those experienced from single exposure. The acute corrosivity of this product makes chronic ingestion of significant amounts unlikely

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE

Asthma, respiratory and cardiovascular disease

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY

None known or reported

ANIMAL TOXICOLOGY

ACUTE TOXICITY:

Inhalation LC 50: >2.04 mg/l (1hr., rat); > 0.51 mg/l (4 hr., rat) - extrapolated from inhalation toxicity studies using calcium hypochlorite

Oral LD 50: Approximately 1200 mg/kg. (rat) based on extrapolation from oral toxicity studies using calcium hypochlorite

Dermal LD 50: > 2 g/kg. (rabbit)

Irritation: Causes burns to eyes. Dry material causes skin irritation, wet material causes skin burns.

ACUTE TARGET ORGAN TOXICITY: This product is corrosive to the eyes and upon inhalation may cause irritation to mucous membranes and respiratory tract. The dry material is irritating to the skin. However when wet, it will produce burns to the skin

CHRONIC TOXICITY:

There are no known or reported effects from repeated exposure except those secondary to burns.

REPRODUCTIVE TOXICITY:

Calcium hypochlorite has been tested for teratogenicity in laboratory animals. Results of this study have shown that calcium hypochlorite is not a teratogen.

CARCINOGENICITY:

This product is not known or reported to be carcinogenic by any reference source, including: IARC, OSHA, NTP or EPA.

One hundred mice were exposed dermally 3 times a week for 18 months to a solution of calcium hypochlorite. Histopathological examination failed to show an increased incidence of tumors.

IARC (International Agency for Research on Cancer) reviewed studies conducted with several hypochlorite salts. IARC has classified hypochlorite salts as having inadequate evidence for carcinogenicity to humans and animals. IARC therefore considers hypochlorite salts to be not classifiable as to their carcinogenicity to humans. (Group 3

substance).

MUTAGENICITY:
Calcium hypochlorite has been tested in the dominant lethal assay in male mice, and it did not induce a dominant lethal response. Calcium hypochlorite has been reported to produce mutagenic activity in two in vitro assays. It has, however, been shown to lack the capability to produce mutations in animals based on results from the micronucleus assay. In vitro assays frequently are inappropriate to judge the mutagenic potential of bactericidal chemicals due to a high degree of cellular toxicity. The concentration which produces mutations in these in vitro assays is significantly greater than the concentrations used for disinfection. Based on high cellular toxicity in in vitro assays and the lack of mutagenicity in animals, the risk of genetic damage to humans is judged not significant.

AQUATIC TOXICITY:
Bluegill, 96 hr. LC50: Approximately 0.12 mg/l (nominal, static) based on extrapolation from studies using calcium hypochlorite
Rainbow trout, 96 hr. LC50: 0.22 mg/l (nominal, static) based on extrapolation from studies using calcium hypochlorite
Daphnia magna, 48 hr. LC50: 0.15 mg/l (nominal, static) based on extrapolation from studies using calcium hypochlorite

TOXICITY TO WILDLIFE:
Bobwhite quail, dietary LC50: > 7,000 ppm based on extrapolation from studies using calcium hypochlorite
Mallard ducklings, dietary LC50: > 7,000 ppm based on extrapolation from studies using calcium hypochlorite
Bobwhite quail, oral LD50: Approximately 4800 mg/kg. based on extrapolation from studies using calcium hypochlorite

SECTION 10 TRANSPORTATION INFORMATION

Due to package capacity, this product is not regulated in transport under U.S. DOT's 49 CFR 172.101.

U.S. DOT Ground: Not Regulated in Transport

ICAO/IATA Air: Not Regulated in Transport

IMDG Ocean: : Not Regulated in Transport

SECTION 11 SPILL AND LEAKAGE PROCEDURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 800-424-9300.
REPORTABLE QUANTITY: 10 lbs. (as Calcium hypochlorite) Per 40 CFR 302.4

SPILL MITIGATION PROCEDURES:
Hazardous concentrations in air may be found in local spill area and immediately downwind. Remove all sources of ignition. Stop source of spill as soon as possible and notify appropriate personnel.

AIR RELEASE: Vapors may be suppressed by the use of a water fog. All water utilized to assist in fume suppression, decontamination or fire suppression may be contaminated and must be contained before disposal and/or treatment.

WATER RELEASE: This material is heavier than water. This material is soluble in water. Monitor all exit water for available chlorine and pH. Advise local authorities of any contaminated water release.

LAND SPILL: Contact at 1-800-6546-911 immediately.
DANGER: All spills of this product should be treated as contaminated. Contaminated product may initiate a chemical reaction which may spontaneously ignite any combustible material present, resulting in a fire of great intensity. In case of a spill, separate all spilled product from packaging, debris and other material. Using a clean broom or shovel, place all spilled product into plastic bags, and place those bags into a clean, dry disposal container, properly marked and labeled. Disposal containers made of plastic or metal are recommended. Do not seal disposal containers tightly. Immediately remove all product in disposal containers to an isolated area outdoors. Place all damaged packaging material in a disposal container of water to assure decontamination (i.e. removal of all product) before disposal. Place all undamaged packaging in a clean, dry container properly marked and labeled. Call for disposal procedures.

SPILL RESIDUES:
Dispose of per guidelines under Section 12, WASTE DISPOSAL.
This material may be neutralized for disposal; you are requested to contact ACEAN at 800-6546-911 before beginning any such operation.

PERSONAL PROTECTION FOR EMERGENCY SPILL AND FIRE-FIGHTING SITUATIONS:
Response to a large quantity spill (100 pounds or greater) or when dusting or decomposition gas exposure could occur requires the use of a positive pressure full face supplied air respirator or self contained breathing apparatus (SCBA), chemical resistant gloves, coveralls and boots. In case of fire, this personal protective equipment should be used in addition to normal fire fighter equipment.

SECTION 12 WASTE DISPOSAL

If this product becomes a waste, it DOES NOT meet the criteria of a hazardous waste as defined under 40 CFR 261, in that it does not exhibit the characteristics of hazardous waste of Subpart C, nor is it listed as a hazardous waste under Subpart D.

As a nonhazardous waste, it should be disposed of in accordance with local, state and federal regulations.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

SECTION 13 ADDITIONAL REGULATORY STATUS INFORMATION

TOXIC SUBSTANCES CONTROL ACT:
This substance is listed on the Toxic Substances Control Act inventory.

SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT TITLE 3:
HAZARD CATEGORIES, PER 40 CFR 370.2:
HEALTH:
Immediate (Acute)
PHYSICAL:
None

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355, APP.A:
EXTREME HAZARDOUS SUBSTANCE - THRESHOLD PLANNING QUANTITY:

None Established

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:

None Established

SECTION 14 ADDITIONAL INFORMATION

REGULATED UNDER FIFRA, USDA & FDA

MSDS REVISION STATUS: Revision to Section 11

SECTION 15 MAJOR REFERENCES

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3. Report on the Acute Inhalation in Rats, Acute Oral LD50 in Rats, Eye Irritation in Rabbits, Dermal Irritation in Rabbits, and Acute Dermal Toxicity in Rabbits of HTH. Biometric Testing Laboratories, Inc., Whippany, NJ. Experiment Reference #A-1490 (RC-30406), February 9, 1975.
4. Report on the Teratogenic Study with Calcium Hypochlorite in Albino Rats. Industrial Bio-Test Laboratories, Inc., Northbrook, IL. IBT #B758b, April 18, 1972.
5. Report on the Mutagenic Study with Monosodium Cyanurate and Calcium Hypochlorite (HTH) in Albino Mice. Industrial Bio-Test Laboratories, Inc., Northbrook, IL. IBT #E756. April 18, 1972.
6. Chemical Hazard Summary No. 20: Calcium Hypochlorite. Canadian Centre for Occupational Health and Safety, Hamilton, Ontario, Canada L8N 1H6. December 1986.
7. Report on 18-Month Dermal Carcinogenicity Study with Monosodium Cyanuric Acid and HTH in Swiss White Mice. Industrial Bio-Test Laboratories, Inc., Northbrook, IL, IBT #651-00751, April 9, 1974.
8. Report to PPG Industries, Inc. on the Acute Toxicity Studies with PITTCHLOR (Granular Calcium Hypochlorite). Industrial Bio-Test Laboratories, Inc., Northbrook, IL, IBT #601-06659, May 7, 1975.
9. Report on the Acute Toxicity of HTH to Bluegill, Rainbow Trout and the Water Flea. E G & G, Bionomics Aquatic Toxicology Laboratory, Wareham, MA, July 1977.
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15. Chemical Hazard Response Information System (CHRIS), Vol. II, U.S. Coast Guard, Washington, D.C., 1984.
16. Chlorine and Your Health. The Chlorine Institute, Inc., Washington, D.C., August 1988.
17. ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices, Seventh Edition, 2001. American Conference of Governmental Industrial Hygienists, Inc., Cincinnati, OH.

18. Amoore, John E. and Earl Hautala, Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatiles for 214 Industrial Chemicals in Air and Water Dilution. Journal of Applied Toxicology, Vol. 3, No. 6, pp. 272-290, 1983.
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20. Report on Acute Dermal Irritation/Corrosivity Study in Albino Rabbits with IG/MgSO4.7H2O 70:30 Blend. Ricerca Toxicology and Pharmacology Laboratory, LLC, Concord, OH. Document # 013977-1. December 13, 2001.

Additional references are available upon request.

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